ORDER

1380.55

AIR TRAFFIC STAFFING STANDARDS PROGRAM

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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FOREWORD

The air traffic staffing standards program provides FAA management objective, scientific tools to determine the number of personnel required nationwide to staff field facilities, to plan and manage human resources, to forecast future staffing requirements, and to study the impact of proposed system changes.

Staffing standards are developed through commonly accepted industrial engineering techniques and operations research analyses such as time study, work sampling, fractioned professional estimate (structured interviewing), statistical analysis, and computer simulation. Staffing standards are based on actual work time required to perform air traffic control functions; take into account workload peaks and certain scheduling constraints; and include allowances for leave, administrative functions, recurring training, and other required noncontrol functions.

In July 1998, responsibility for the air traffic staffing standards program was transferred to the Air Traffic Service. This order sets forth policies, responsibilities, guidance and procedures for the development, application, and use of the air traffic staffing standards, models, and guides.

Ronald E. Morgan
Director of Air Traffic

12/20/98
Date

TABLE OF CONTENTS

CHAPTER 1. GENERAL

1. PURPOSE. This order sets forth policies, responsibilities, guidance, and procedures for the development, application, and use of the air traffic staffing standards, models, and guides.

2. DISTRIBUTION. This order is distributed to the Office of Aviation Policy and Plans, the branch level in the Air Traffic Service and in the regional Air Traffic Divisions, and a limited distribution to the air traffic field facilities.

3. BACKGROUND.

a. Since the early 1960's the Federal Aviation Administration (FAA) has used some form of work measurement to derive formulas and criteria to develop and support its budget requests for the staffing required to operate air traffic control facilities. Prior to 1970, Order 7031.5, Airway Planning Standard Number Five, A Staffing Guide for Air Traffic Facilities, provided national norms which had been established from historical experience. In 1970, regression formulas were introduced as interim criteria pending development of facility level staffing standards. The facility level standards were published in 1973 in Order 1380.33, Air Traffic Control Staffing Standards System.

b. In 1978, at the direction of the Administrator, a joint Office of Management Systems and Air Traffic Service task force was organized to define and direct an effort to develop new standards for the air route traffic control centers and the air traffic control terminals. These new standards were approved by the Administrator in 1979 and were published in Order 1380.33B, Air Traffic Staffing Standards System which was canceled in 1996.

c. The Office of Management Systems, later the Office of Aviation Policy and Plans, and then the Office of Business Information and Consultation, developed a series of staffing standards from 1985 until 1998. While these were never published in a directive, they were published in report form and used to develop air traffic staffing requests.

d. In 1998, as a result of the FAA appropriations bill, the Office of Business Information and Consultation was abolished and its various management analysis functions were devolved to the individual associate administrators. Therefore, the responsibility for the air traffic staffing standards program was transferred to the Associate Administrator for Air Traffic Services and then redelegated to the Air Traffic Service.

e. Order 1380.33B, Air Traffic Staffing Standards System, was canceled on September 30, 1996, because it was obsolete. The decision not to update it was based on

the difficulties of maintaining the currency of an order that provided detailed option-specific staffing standards models in today's dynamic air traffic control environment.

f. Order 1380.34A, Staffing Standards Program, which covered the agencywide staffing standards program will be canceled in the near future because of the devolution of the responsibility for the staffing standards programs to each of the associate administrators.

g. In 1993, the Deputy Administrator formed the Staffing Standards Review Committee (SSRC) to review the purpose and role of the staffing standards program in the agency. The SSRC reviewed and accepted the current methodology used to estimate staffing requirements, and reviewed and affirmed controller availability factors, the notion of staffing for the 90th percentile (37th) busiest day, and the revised pipeline model. The terminal approach control facility (TRACON) staffing standards were validated and a revision to the air route traffic control center (ARTCC) staffing standards was begun under the auspices of the SSRC.

h. In July 1995, Congress directed the National Academy of Sciences (Academy) to study methodologies by which the FAA could determine the required number of controllers at each of its facilities. The findings affirmed the current methods used to forecast staffing requirements. The Academy found that the FAA could not accurately forecast the number of controllers at the individual facility level because the standards were not designed to do so. The Academy also determined that it was unlikely that the current staffing standards could be modified to provide stand-alone facility-level estimates. The study is documented in a 1997 report "Air Traffic Control Facilities - Improving Methods to Determine Staffing Requirements," Special Report 250, Transportation Research Board, National Research Council.

i. In the past, staffing standards and guides were used as the bases for requesting staffing resources in the budget process. Over the last several years, different methods of determining national staffing requirements have evolved. This, however, does not preclude the need for the air traffic staffing standards program for many reasons. Air traffic management still needs an objective, scientific method to determine the number of controllers and specialists required nationwide to staff field facilities, to plan and manage human resources, to forecast future staffing requirements, and to study the impact of proposed system changes.

4. DEFINITIONS.

a. A staffing model is a system of models based on mathematical, statistical, operations research and/or engineering analysis. Some of the component models are

simple mathematical formulas, equations, algorithms, and/or tables. Other components may be more sophisticated computer models including scheduling, linear programming, optimization, and simulation models.

b. Staffing standards are staffing models based on work measurement used to compute the number of persons required to perform a job or a set of tasks, expressed as a function of some measurable quantity which generated the work and is known as "workload". Air traffic staffing standards include appropriate allowances for leave, training, travel, and necessary administrative functions. The standards also include a "pipeline" model which calculates the number of personnel that must be in training to replace full performance level controllers as they leave the system.

c. Staffing guides are less precise staffing models used to compute the staffing required to perform specific functions. They are usually developed without work measurement, relying rather on a combination of historical data, surveys, and/or professional judgment. Guides also include appropriate allowances for leave, training, travel, and necessary administrative functions.

5. OBJECTIVE. The objective of the air traffic staffing standards program is to provide management with the best possible tools for managing, planning, and forecasting human resources. These tools should be the highest quality commensurate with technical feasibility and cost.

6. COVERAGE. This order covers all working controllers with existing standards, models, or guides in the air route traffic control centers and the air traffic control terminal facilities, and the specialist in the automated flight service stations. The order also covers any additional personnel in the air traffic work force for which staffing standards, models, or guides are developed in the future.

7. USES. The air traffic staffing standards, models, and guides:

a. Provide tools for managing and planning human resources.

b. Provide method for forecasting future personnel requirements.

c. Inform management how changes in activity impact resource requirements.

d. Assess the impact of proposed changes to the air traffic system, including new procedures and equipment.

e. Provide baselines and models for other "what if" analyses.

8. INAPPROPRIATE USES. The air traffic staffing standards, models, and guides shall not be used:

a. As performance standards that controllers or facilities are required to meet.

b. To determine grades, pay level, or similar items.

9. APPLICATION.

a. In the application of the staffing standards, the staffing models are usually applied to a busy day rather than the average day. For most air traffic standards this is the 90th percentile (37th) busiest day, or for future staffing requirements, the forecasted 90th percentile day. The 90th percentile day figure traditionally has been used and was reaffirmed by the SSRC in 1993. Air traffic staffing standards are designed to produce adequate, but not excessive, levels of staffing to accomplish variable workload demands at an acceptable level of quality.

b. Staffing standards are derived primarily from on-site work measurements of qualified personnel performing control duties during the busier work demand time periods. Since the work measurements are, by necessity, a sample of the operational air traffic control system, the resulting staffing standards and models are statistical constructions. Due to these statistical characteristics, it is not expected that the standards can be applied inflexibly at every facility and for every possible control situation. Conversely, aggregate applications of the standards can be expected to provide total staffing levels adequate to meet most local variations.

c. Estimates for future staffing requirements are based on the air traffic forecasts provided by the Office of Aviation Policy and Plans if possible. The year-to-year annual growth rates developed in these forecasts are applied to the current year's 90th percentile day to estimate the 90th percentile day for the forecast years.

10. DEVELOPMENT.

a. Staffing standards are developed through commonly accepted industrial engineering techniques and operations research analyses such as time study, work sampling, fractioned professional estimate (structured interviewing), statistical analysis,

and computer simulation. Guides may use these techniques and others such as historical data, surveys, and/or professional judgment.

b. Development steps include defining the project's goals, selecting appropriate work measures, collecting and analyzing the data, developing the staffing models and allowances, and preparing written documentation of the standards, models, and/or guides. A detailed discussion about development is contained in Chapter 2, Development and Updating.

11. UPDATING. To maintain their validity, staffing standards, models, and guides require maintenance and updating on a regular basis. Ongoing monitoring of changes in the air traffic control system, equipment, policies, and procedures aid in determining the need to review, validate, and revise the standards, models, and guides. Updating is further discussed in Chapter 2.

12. RESPONSIBILITIES.

a. Air Traffic Service. The Air Traffic Service is responsible for:

(1) Using the results of the application of the staffing standards, models, or guides as tools in managing and planning air traffic human resources and when forecasting future requirements.

(2) Using the staffing standards, models, or guides in planning, performing sensitivity analyses, and evaluating new equipment, procedures, airspace configuration, and any other changes to the air traffic control system which may impact staffing requirements.

b. Air Traffic Resource Management Program. The Air Traffic Resource Management Program (ATX) is responsible for:

(1) Exercising primary responsibility for the air traffic staffing standards program, including development, application, program evaluation, and maintenance of staffing standards, models, and guides.

(2) Maintaining technical expertise in all aspects of the development, program evaluation, and application of procedures to assist management in allocating and predicting future requirements for human resources.

(3) Recommending the approach and methodology to be used and the type of data required; overseeing data collection and analysis; and providing the expertise required to develop and maintain the staffing standards, models, and guides.

(4) Evaluating the continuing validity of the staffing standards, models, and guides.

(5) Assuring the staffing standards, models, and guides are current and accurate by analyzing staffing requirements, including continuous monitoring and periodic revalidation studies, and by evaluating productivity changes resulting from new work methods, procedures, organization, technology, or equipment.

(6) Initiating proposals for the development of new and the modification of existing staffing standards, models, and guides.

(7) Reviewing each of the staffing standards, models, and guides and recommending approval, disapproval, or modifications, as necessary, to meet the requirements of the Air Traffic Service.

(8) Developing and maintaining a computer system for the staffing standards application.

(9) Developing and maintaining a users guide and a separate set of systems documentation for the application software.

(10) Preparing and issuing a report that fully documents each of the air traffic staffing standards, models, and guides.

(11) Maintaining a systems of records for the staffing standards, models, and guides.

(12) Administering the task order contract available to all offices within FAA for the development and revision of all agency staffing standards programs.

13. AUTHORITY TO CHANGE THIS ORDER. Changes to this order shall be approved by the Director of Air Traffic. Recommendations for changes should be presented to the Program Director for Air Traffic Resource Management, ATX-1.

14. - 19. RESERVED.

CHAPTER 2. DEVELOPMENT & UPDATING

20. GENERAL.

a. Staffing standards are developed through commonly accepted industrial engineering techniques and operations research analyses such as time study, work sampling, fractioned professional estimate (structured interviewing), statistical analysis, and computer simulation. The development of staffing guides may include these steps but usually rely on historical data, surveys, and professional judgment.

b. Generally the steps include defining the project's goals, becoming familiar with the organization and its work, selecting appropriate work measures, collecting and analyzing data, developing staffing model(s), determining the best technique for forecasting future staffing requirements, developing any necessary allowances or factors, and preparing documentation. Preparing clear written documentation of the staffing standards, models, and guides as well as any associated computer system is a vital component of the development process.

21. DEFINITION OF PROJECT GOALS. Carefully and precisely defining the goals for the development project is the critical first step in developing staffing standards, models, or guides. Defining goals means more than just composing a clear concise statement of the project, its scope, and its goals. It means explaining and interpreting their implications, understanding their effects, and determining their importance to management. Defining goals also includes defining the required accuracy, defining an acceptable schedule, and determining the scope of the project and the resources that can be used. A clear, precise goal definition is important in selecting the techniques to be used.

22. ESTABLISHMENT OF PROJECT TEAM. A project team or work group should be established for the development effort. The group should consist of, at minimum, an industrial engineer or operations research analyst and an air traffic control specialist experienced in the functions for which the standards or guides are being developed. For large projects, inclusion of air traffic control specialists from regional offices and/or field facilities should be considered. Other personnel such as statisticians or work measurement specialists may be included as necessary.

23. FAMILIARIZATION. Project personnel must become familiar with the organization's mission, management relationships, and internal organizational structure. This process may include reviewing reports of previous studies; reviewing staffing documents; analyzing position descriptions; reviewing organization charts; contacting office personnel, managers, and technical experts in the functional area; and visiting facilities where the functions are actually performed.

24. DATA COLLECTION.

a. Mutually exclusive tasks should be defined. A well-defined task has a clear beginning and end. It is readily understood by everyone on the project team. Based on the tasks, an appropriate data collection methodology is selected. For most of the air traffic staffing standards and models, the appropriate method is work measurement, but in some cases it may be some other method, e.g., a questionnaire perhaps. Determining the number of work measurements to be taken and the number of sites to be visited, which are functions of accuracy and resource limitations, are also parts of the data collection plan. Selection of the appropriate method and the sample sizes depends on various considerations and is determined by the work group or technical members of the team.

b. Identifying candidate workload drivers, that which causes the tasks to occur, is also part of the data collection plan. Workload drivers should correlate well with the amount of work being performed. They should also be chosen to minimize the need for new and extensive records and reporting systems.

c. Generally one or more sites is selected for pretesting. Pretesting allows the selected data collection methodology to be tested prior to full scale data collection. Data collection procedures, measurement tools, etc., can be modified, if needed, to ensure data collected will be useable.

d. After the data collection methodology has been pretested and revised to ensure useable data, the data are collected. It is imperative that all of the personnel doing data collection be trained on how to collect the data and that they follow the data collection plan precisely. This ensures comparability between the data collected at the various sites.

25. DEVELOPMENT. Once data are collected, they are analyzed to develop the models and/or procedures and process for determining staffing requirements. The final workload drivers are selected during this step. Scheduling algorithms may also be developed, revised, and/or applied. Any necessary adjustments and allowances should be calculated.

26. VALIDATION. After the staffing models are developed they need to be validated by using actual counts for the workload drivers in the models and producing the annual staffing requirements. These results are then compared with the actual on-board staffing and any differences should be investigated. Differences could be caused by inaccuracies

in the models, some aberration in the on-board staffing, or some other factors. If the models are not accurate, they should be adjusted accordingly.

27. FORECASTING. A forecasting model should be developed and implemented. This is used to estimate future staffing requirements, training requirements, and other aspects of managing and planning future human resources. If applicable, the Office of Aviation Policy and Plans' aviation activity forecasting system should be used in the application of the forecasting tool.

28. APPLICATION SYSTEM. A computer system should be designed and developed to support the application of the staffing standards. The software should be structured to interface with any pertinent databases and to accommodate any future maintenance, enhancements, and model updates.

29. UPDATES.

a. The air traffic staffing standards, models, and guides shall be reviewed and updated at periodic intervals. The interval between updates will usually be 3 to 5 years, depending on the amount of changes in the air traffic organization, the air traffic control system, and fiscal constraints.

b. The review should include an evaluation of the tasks and an analysis of the impact of the changes in the following areas:

(1) Program mission or operational environment.

(2) Organizational structure or functional alignment.

(3) Program priorities and/or work functions.

(4) System or procedures.

(5) Technology or equipment.

(6) Personnel qualification or classification.

(7) Personnel mix.

(8) Variation between staffing standards requirements and on-board staffing or perceived staffing requirements.

CHAPTER 3. DOCUMENTATION

30. ISSUANCE OF STANDARDS. The Air Traffic Resource Management Program (ATX) will publish the staffing standards, models, and guides in report form.

31. STAFFING STANDARDS REPORTS.

a. The Air Traffic Resource Management Program will prepare and issue a Staffing Standards Report, or series of reports, for each of the air traffic staffing standards, models, and guides. These reports shall serve as official guidance and, as such, shall be signed by the Program Director for Air Traffic Resource Management.

b. The Staffing Standards Report should include a discussion of the purpose and objectives of the standards, a description of the specific work force covered, a brief description of the methodology used to develop or modify these standards, and how the resulting staffing requirements should or should not be used. All assumptions, algorithms, equations, formulas, factors, allowances, and descriptions of all required input data with their sources should also be included. As each staffing standards, model, or guide is updated or modified, the Air Traffic Resource Management Program is responsible for ensuring that these reports and all documentation remain current.

c. These reports may be obtained from Staffing Standards, ATX-330, in the Air Traffic Resource Management Program and from the FAA intranet in the near future.

32. APPLICATION SYSTEM DOCUMENTATION.

a. A Users Guide for the application software system should be prepared for each staffing standards, model, or guide. It should contain step-by-step instructions on how to produce the annual staffing requirements. The Users Guide should be written so that a person with no programming experience and average experience with personal computers can understand the document and run the application.

b. Systems documentation for the application software should be prepared. It is intended for computer programmers or systems analysts who must maintain, modify, and update the customized software. It should include a flow chart of how the various programs interface, a brief description of each module or subprogram, a list of each variable with a description, and a complete description of all inputs and outputs. Examples should be included as practicable. All of the supporting documents such as software documentation and code should be included.

33. SYSTEM OF RECORDS. Staffing Standards, ATX-330, shall maintain a system of records for all of the staffing standards, models, and guides. At a minimum, this system will track how individual standards are being maintained, how data were collected and analyzed, how the staffing standards, models, formulas, equations were developed, and the most current staffing standards application available. The system of records shall include all contractor prepared technical reports, the Staffing Standards Reports, the Users Guides and system documentation, and all relevant directives. This system of records will be revised as changes occur and reviewed every three years to insure that the system is accurate and effective.

34. - 39. RESERVED.